

Solving Intermittent Transport Stream Problems with CaptureVu™ Technology



► Figure 1. MTS400 with CaptureVu™ technology feature.

The MTS400 - A new type of MPEG Analyzer

MTS400 and MTS430 are a new type of MPEG analyzer. Designed to enhance your personal productivity and reduce time to market for your products, the MTS400 family brings the toolset of logic analyzer to MPEG video analysis.

Additionally, the MTS400 family provides a new, highly intuitive user interface which is focused on a problem centric view of solving challenging MPEG transport stream issues.

One of the MTS400's key tools is CaptureVu™ technology, an innovative triggering and stream capture system that allows you to find those difficult intermittent and complex problems that traditional analyzers miss during debug.

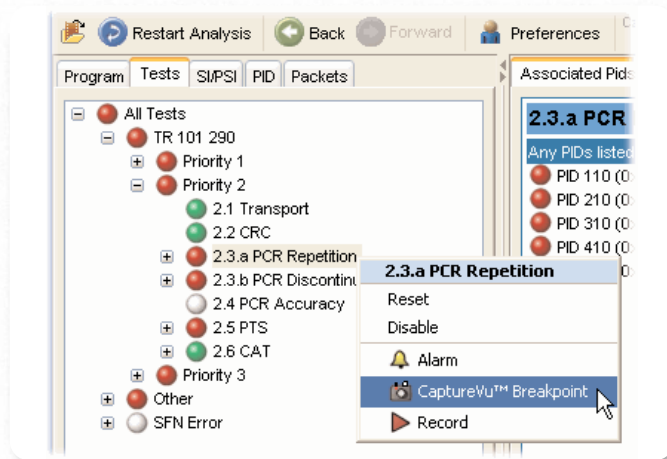
CaptureVu™ technology allows you to set an error break point on an incoming real time or stored MPEG transport

stream. By setting specific conditions for CaptureVu™ technology you allow the analyzer to find intermittent problems for you, trigger a recording to memory, or stop analysis to allow you to drill down to the route cause of an issue quickly and efficiently.

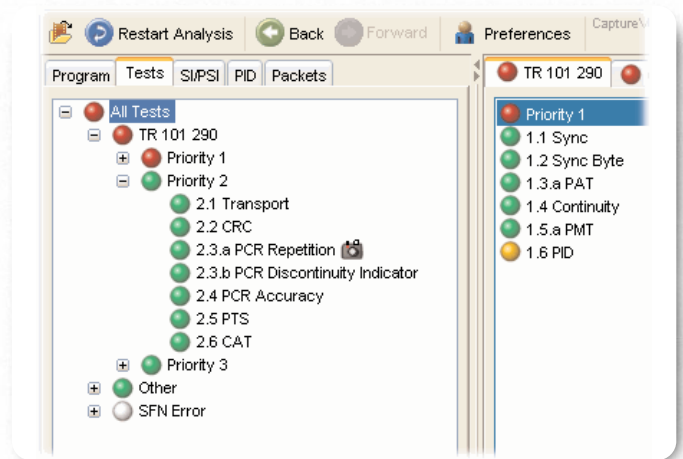
CaptureVu™ technology significantly enhances MPEG system debug both for network commissioning and deployment, infrastructure equipment and consumer equipment development.

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► **Figure 2.** Selecting a CaptureVu™ technology feature Breakpoint.



► **Figure 3.** CaptureVu™ technology feature Breakpoint set on TR 101 290 2.3a PCR Repetition.

CaptureVu™ technology - An Overview

CaptureVu™ technology allows you to set, capture and analyze MPEG Transport Stream events during both deferred and real-time analysis. This includes real time CaptureVu™ technology analysis of live IP streams carrying MPEG data arriving at the analyzer's Ethernet port.

To use CaptureVu™ technology you set a break point trigger on any of the MPEG measurement parameters that the MTS400 can make. When a test flagged with CaptureVu™ technology executes and fails the analyzer stops at the transport packet containing the errored data.

In real time mode the analyzer stores a record of the 200 MByte of transport stream prior to the CaptureVu™ technology trigger point.

Trigger options for CaptureVu™ technology include:


- ETSI TR 101 290 1st, 2nd, 3rd priority tests
- Multiplex occupancy outside of user defined limits
- Tests including: SFN, ISDB, ATSC PSIP, and PCR OJ, FO, and DR.

Links to the test and the packet at the point at which the test failed are available in the CaptureVu™ technology Settings dialog box.

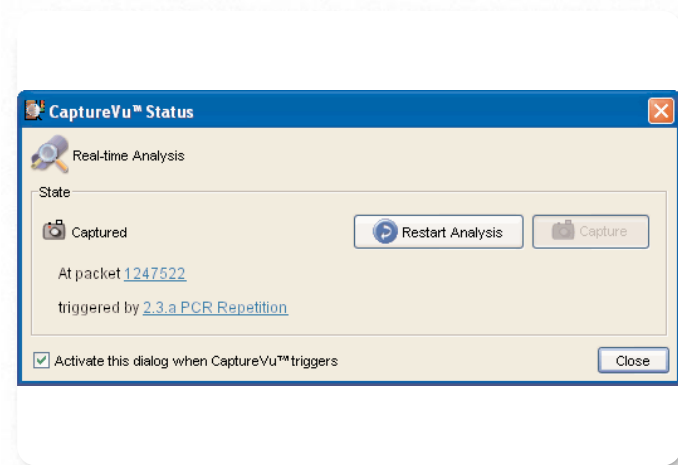
Setting Up CaptureVu™ Technology

CaptureVu™ technology is activated when a test flagged with a CaptureVu™ technology breakpoint falls outside the parameters set for the test. Breakpoints can be set at any time. In real time mode CaptureVu™ technology will activate as soon as the flagged test fails.

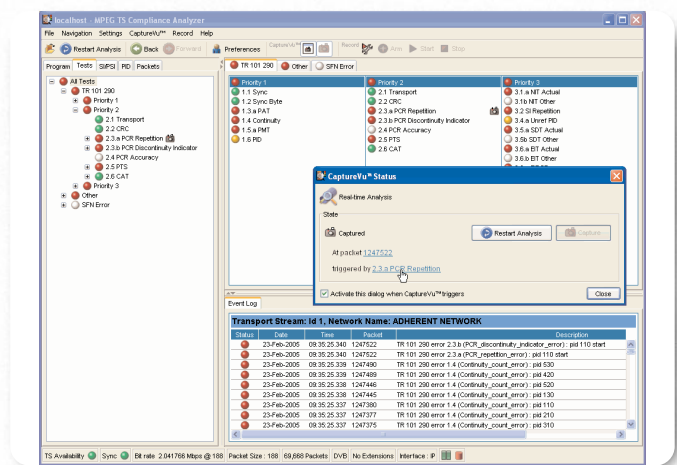
You can set a CaptureVu™ technology breakpoint as follows: In either the Program or Tests view, locate and highlight the test required. From the right-click menu, select CaptureVu™ technology Breakpoint (Figure 2).

Note the addition of the CaptureVu™ technology icon  beside the test entry (Figure 3).

The CaptureVu™ technology breakpoint is now set. You can set as many breakpoints as you require, tests being performed have their failure triggered via a logical OR of all results. When an error is next detected on any breakpoint test, analysis (real-time or deferred) will be stopped and the test identified.



► Figure 4. CaptureVu™ technology Breakpoint activation dialog.



► Figure 5. CaptureVu™ technology feature Breakpoint - test view.

CaptureVu™ Technology Analysis

The CaptureVu™ technology breakpoint will operate during real-time and deferred analysis. The CaptureVu™ technology Settings dialog box is displayed as soon as a breakpoint is activated (Figure 4).

In real time CaptureVu™ technology the displayed dialog box contains the following fields:

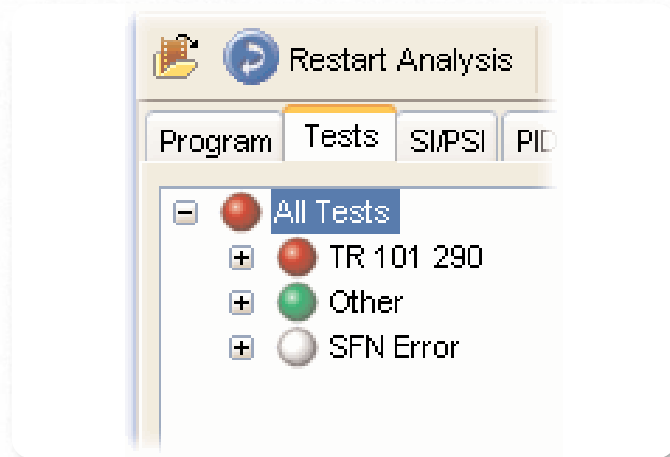
- This dialog box displays the transport packet in which the test has failed
- This dialog box displays the test at which the test has failed

Clicking either the “triggered by” or the “At packet” link will open the related view (Tests or Packets) and highlight the relevant test or packet (Figure 5).

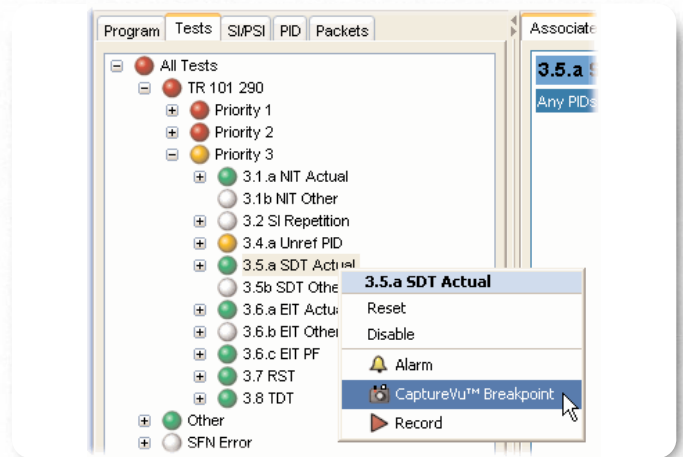
When enabled, the CaptureVu™ technology setting dialog box is opened automatically when a breakpoint occurs. The CaptureVu™ technology Settings dialog box can also be viewed at any time by selecting the CaptureVu™ technology Settings button on the tool bar.

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► Figure 6. MTS400 family test view.



► Figure 7. Selecting CaptureVu™ technology feature trigger on test 3.5.a SDT Actual.


How CaptureVu™ Technology solves your stream problems

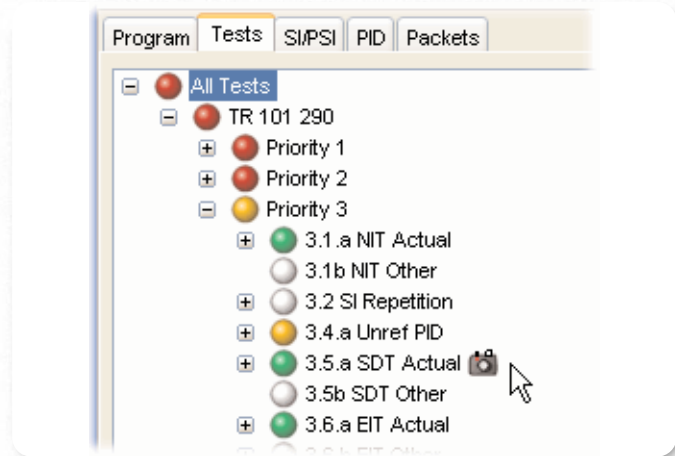
The following example shows how to use CaptureVu™ technology to solve real world problems with a pre captured complex transport stream, and how to drill down to get graphical confirmation of the transport stream error.

To do this we set a CaptureVu™ technology break point on a TR 101 290 error defined by the DVB Measurement Guidelines for a Service Description Table Actual error (SDT Actual). This test defined in TR 101 290 as test 3.5a checks that the SDT information which describes the services contained in a particular Transport Stream is transmitted at least every 2 seconds on PID 0x0011.

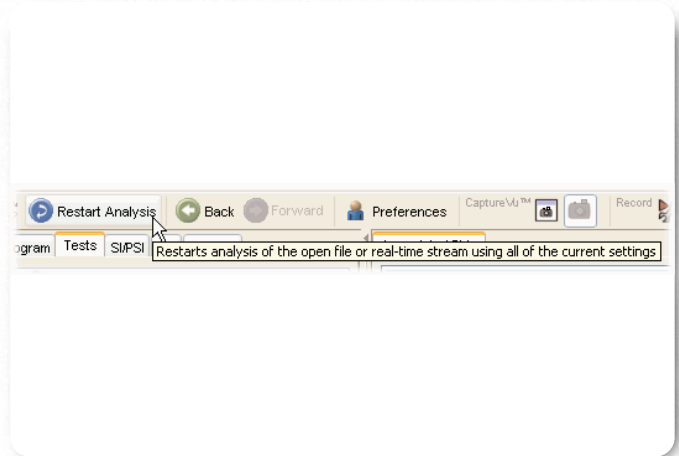
The following shows how to trap a suspected infringement of SDT repetition rate which could cause a set top box operational issues.

Firstly clicking on the Test tab of the analyzer produces a list of all tests undertaken, clicking on TR 101 290 takes you down a layer to the explicit priority 1, 2 and 3 test, with SDT actual residing under priority 3 test (Figure 6).


By right clicking on the test 3.5.a SDT Actual, a dialog appears which allows you to select CaptureVu™ technology by clicking on the  CaptureVu™ technology icon (Figure 7).

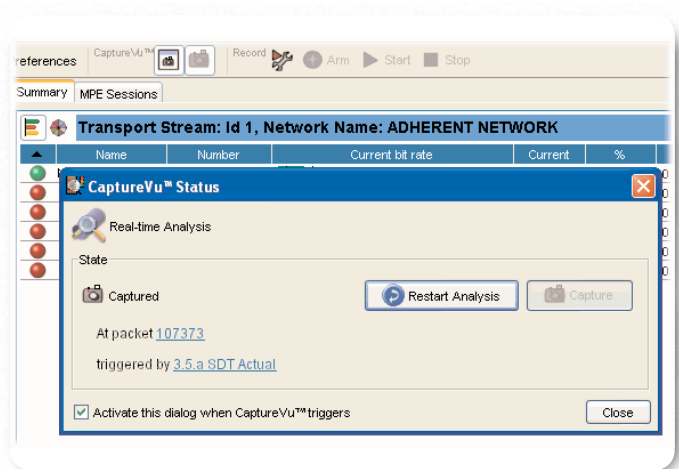


► Figure 8. CaptureVu™ technology feature set on test 3.5.a SDT Actual.



► Figure 9. Resuming Analysis.

When selected, the  CaptureVu™ technology icon appears against the selected test (Figure 8).



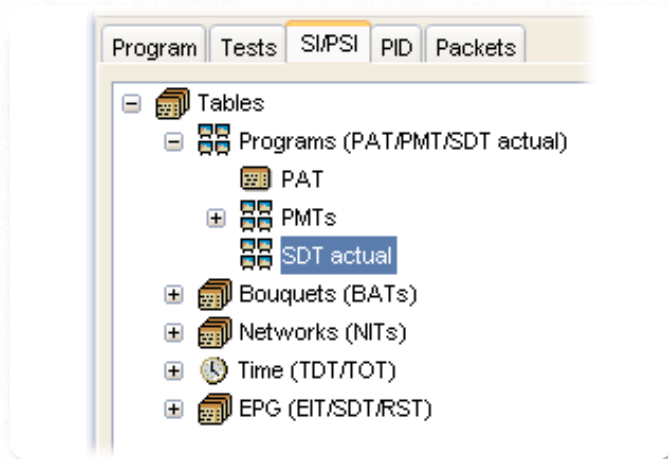
► Figure 10. Real-time CaptureVu™ technology feature of 3.5.a test SDT Actual.

The analysis can now be restarted to find the next occurrence of a SDT Actual timing infringement (Figure 9).

When the analyzer detects the next SDT Actual error condition is pauses analysis and captures the fault showing the fault and packet number where it occurred (Figure 10).

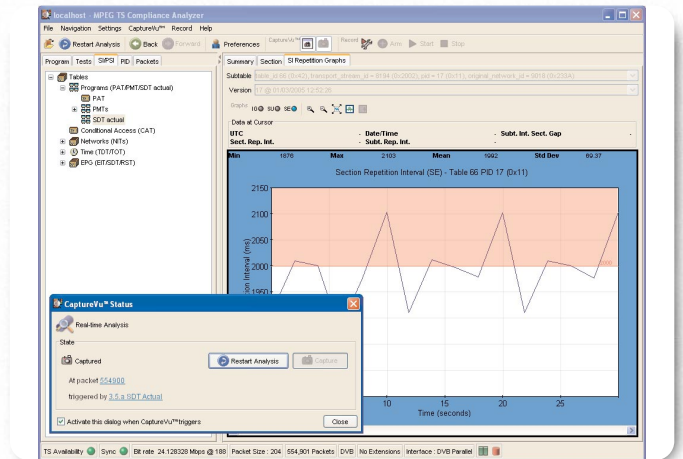
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► Figure 12. SI/PSI Analysis selection.

Clicking on the SI/PSI Tab (Figure 12) of the analyzer allows the SDT Actual timing graphs to be displayed showing the timing infringement where the table repetition rate has exceeded the 2,000mS limit (Figure 13).



► Figure 13. SDT Actual timing graph with limits mask shown.

Clicking on the Restart Analysis button will allow the next SDT Actual error to be quickly found, quantified and logged.

Conclusion

In conclusion, CaptureVu™ technology provides the ideal tool for rapidly finding and isolating difficult intermittent problems in Transport Streams, both in real time and deferred time, saving you time, money and improving customer satisfaction.

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